Applicants:

P. WUTRICH

B. HUET DE BAROCHEZ

V. LEGRAND C. CASTAN

Serial N°:

10/519,641

Filed:

July 15, 2005

Title:

Microcapsules for the delayed and controlled release of perindopril

Art Unit:

1615

Examiner:

Jeffrey T. Palenik

Honorable Commissioner of Patents PO BOX 1450 Alexandria, VA 22313

DECLARATION UNDER 37 CFR 1.132

I, Patrick WUTHRICH, a citizen of France, of 937, rue de la Loire 45560 Saint-Denis-en-Val, France, declare and say that:

I am Director of Pharmaceutical Development at the Les Laboratoires Servier, Orleans. My interest of investigation consists of formulation research and developent. I refer to my CV for an extensive overview of my backgrounds and qualifications, of which a copy is attached as Annex I.

I am one of the co-inventors of US Patent Application Serial n° 10/519,641 filed July 15, 2005 concerning "Microcapsules for the delayed and controlled release of perindopril".

I am thoroughly familiar with the above-mentioned patent application and fully support the formulation and pharmacokinetic data contained therein which were performed either by me or under my supervision. I also fully support the conclusions derived and the arguments presented as concerns the therapeutic interest and plasma concentration time curves of the delayed and controlled release form of perindopril described.

The oral pharmaceutical forms disclosed in the present patent application (US Serial n°10/519,641) are used in the treatment of arterial hypertension and heart failure and also have demonstrated original activity in the following pharmacokinetic trials.

result from the study CL2-5492-004 "Pharmacokinetictrials pharmacodynamic relationship and safety assessment after evening administrations of perindopril as small-size particles (type I, 4mg and type II, 5mg) and morning administrations of perindopril as immediate-release tablet (3.338mg)" finalized in October 20, 2005. This study corresponds to a phase II, 2 weeks parallel group study in primary hypertensive patients.

Applicant has enclosed curves of in vivo blood level concentrations of perindopril over time obtained during pharmacokinetic evaluations. Pharmaceutical composition administered to patients during said pharmacokinetic evaluation consists in microcapsules of perindopril covered by at least one coating film comprising at least one hydrophilic polymer A and at least one hydrophobic compound B according to the present invention.

A latent period of about 4 hours is observed wherein the active principle, perindopril, is not released in the plasma and said latent period is followed by a controlled-release period of about 12 hours.

A latent period of about 8 hours is observed wherein the active principle, perindoprilat (active compound liberated in vivo by enzyme action), is not released in the plasma and said latent period is followed by a controlled-release period of about 14-16 hours.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment or both, under section 1001 of the title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

Further declarant sayeth not

Stall wit

Patrick WUTHRICH

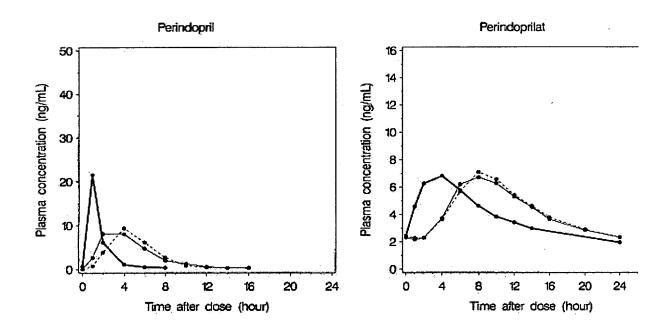
Executed at : Orléans
Date : April 24, 2003

Postal address:

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Mean perindopril and perindoprilat plasma concentration-time curves obtained after repeated morning oral administrations of perindopril as an immediate-release tablet (3.338 mg) or repeated evening oral administrations of perindopril as small-size microparticles (type I 4 mg or type II 5 mg) in hypertensive patients



Full bold line: immediate-release tablet (3.338 mg)
Full line: small-size microparticles (type I, 4 mg)
Dashed line: small-size microparticles (type II, 5 mg)

Secondary pharmacokinetic parameters of perindopril and perindoprilat obtained by non-compartmental analysis following repeated once-a-day oral administrations of perindopril (on D14/D15 or D15/D16, depending on the dosage regimen)

<u>~</u>	Perindopril		AUC	ာ (n	AUCτ (ng.h/mL)	L)	ر "	C _{max} (ng/mľ	g/mL			tm	t _{max} (b)				C _{min} (C _{min} (ng/mL)			tlag	t _{lag} (h)		
Form	Form Dose N Mean s.d. min max Mean s.d. min	Z	Mean	s.d.	min	max	Mean	s.d.	mim	max	max Median Q1 Q3 min max Mean s.d. min max Median Q1 Q3 min max	01	63	min	тах	Mean	s.d.	min	max	Median	QI	03	min	max
1	3.338 mg 13 30 16 12 63	13	30	16	12	63	22 12 9.0	12	9.0	43	1.0 0.95 1.0 0.020 1.1 BLQ BLQ BLQ BLQ 0	0.95	1.0	0.020		BLQ	BLC	BLC	BLQ	0	0 0 0	0	0	0
2	4 mg 33 36 15 11 67	33	36	15	Ξ	29	12	6.1 3.2	3.2	28	4.0	3.5	4.3	1.6	8.0	BLQ	BLC	BLC	4.0 3.5 4.3 1.6 8.0 BLQ BLQ BLQ BLQ	1.0 0.50 1.9 0 2.0	0.50	1.9	0	2.0
7	5 mg	35	40	17	17 16 98	86	12 5.7 5.3	5.7	5.3	34	4.0	3.9	5.9	1.9	8.0	BLQ	BLC	BLC	BLQ	3.9 5.9 1.9 8.0 BLQ BLQ BLQ BLQ 0.95		1.0	0 1.0 0 2.0	2.0

Per	Perindoprilat		AUC	ال کر (ا	AUCT (ng.h/mL)	L)	ບ້	E) XBI	C _{max} (ng/mL)			tmax	t _{max} (h)			ڻ	in (n)	C _{min} (ng/mL)			ţ	t _{lag} (h)		
Form	Dosc	Z	N Mean s.d. min max Mean s.d.	s.d.	min	max	Mean	s.d.	min	max	min max Median Q1 Q3 min max Mean s.d. min max Median Q1 Q3 min max	01	3	mim	max	Mean	s.d.	mim	max	Median	01	(33	mim	max
1	3.338 mg 13 91 13 72 112 6.9 1.3	13	91	13	72	112	6.9	1.3		10	5.0 10 4.0 3.9 4.0 2.0 6.0 1.9 0.39 1.5 2.6	3.9	4.0	2.0	6.0	1.9	0.39	1.5	2.6	0	0	0	0 0 0	0
2	gm 4	33	66	27	55	156	27 55 156 7.2 2.4	2.4	3.3	3.3 14	8.0	7.0	8.0	5.5	4	7.0 8.0 5.5 14 2.3 0.70 1.2 4.1	0.70	1.2	4.1	1.1	0.92	1.9	0	0.92 1.9 0 4.0
2	5 mg	35	100	25	53	170	100 25 53 170 7.4 2.5	2.5	3.1	3.1 15	8.0	0.9	6.6	5.9	14	8.0 6.0 9.9 5.9 14 2.3 0.53 1.4 3.4	0.53	1.4	3.4	1.8 0.92 2.0 0 4.0	0.92	2.0	0	4.0

Form 1: Immediate-release Form 2: Small-size microparticles

Q3:75th percentile

Q1: 25th percentile BLQ: below the quantitation limit

CURRICULUM VITAE

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EDUCATION

1986-1989 Ph.D. Thesis (Pharmaceutical Formulation Department - University of Geneva -

Switzerland)

1984 Pharmacist (University of Geneva - Switzerland)

PROFESSIONAL ACTIVITIES

2008 Director, Head of Pharmaceutical Development - General Manager of the

Pharmaceutical Development Center - (SERVIER)

2006-2007 General Manager of the Pharmaceutical Development Center (SERVIER)

1995-2006 Manager of Pharmaceutical Formulation Department (SERVIER)

1992 - 1995 Manager of Pharmaceutical Formulation Department (EUROPEPTIDES -

France)

1991 Post-doctoral Researcher (Laboratoires UPSA - France)

1990-1991 International Fellow, Controlled Release & Biomedical Polymers

Department SRI International, Menlo Park, Californie (USA) - Grant of Swiss

National Fund for Research

1989-1990 Deputy Pharmacist - Pharmacy of the Geriatrics Hospital in Geneva

(Switzerland)

Deputy Pharmacist - Pharmacie La Combe in Nyon (Switzerland)

1986 - 1990 Doctoral Deputy - Pharmaceutical Formulation Laboratory - University of

Geneva - Member of the National Commission for the Helvetian VII

Pharmacopoeia

1984 - 1985 Deputy Pharmacist - Pharmacy Munier SA, Geneva (Switzerland)

1982 - 1983 Deputy Pharmacist - Pharmacy Metro Shopping, Victoria, Vernier, Rossi

Geneva (Switzerland)

1981 - 1982 Deputy Pharmacist - In charge of analytical control of raw materials -

Pharmaceutical Firm Uhlmann-Eyraud, Geneva (Switzerland)

SCIENTIFIC WORKS

Publications:

P. Wüthrich et P. Buri,

"Aspects de l'anatomie et de la physiologie nasale"

Pharm. Acta Helv. 12, 322-331 (1989)

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Title: Supramolecular Organization of S12363-liposomes Prepared with Two Different Remote Loading Processes Article Type: Regular Paper BBA Section: BBA - Biomembranes Corresponding Author: Miss Caroline Chemin All Authors: Caroline Chemin, Ph.D. student; Jean-Manuel PEAN; Claudie BOURGAUX; Georg Pabst; Patrick WUTHRICH; Patrick COUVREUR; Michel OLLIVON Submit Date: Jun 28, 2008

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G. Tolis, V. Markusis, G. Krassas, Th. Skaltsas, J. Ponticidis, H. Moschoyannis, F. Boutignon, V. Lenaerts, P. Wüthrich et R. Deghenghi, "Enhancement of Hexarelin Induced Growth Hormone Release by an Inhibitor of Lipolysis in Women with the Polycystic Ovarian Syndrome"

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P. Wüthrich

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F. Boutignon, H. Touchet, S. David, P. Wüthrich, R. Deghenghi, H. Ong, M. Dubuc, M. Cesana and T. Maggi

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"Swelling restriction of hydrophilic matrices by aqueous coating: an efficient way to control the dissolution profile of a water soluble drug substance"

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G. Fonknechten, P. Genty and P. Wüthrich

"Formulation of semi-solid matrices : application to a very water soluble drug substance" Pharmaceutical Technology Conference and exhibition, Athen, April 15-17, 1997

G. Pichon, G. Briault, I. Rault, H. Rolland and P. Wüthrich

"In vitro transdermal permeation of a hydrosoluble drug - efficacy of enhancers versus iontophoresis"

Symposium on Transdermal Administration. A cas study, Iontophoresis, Paris, March 3-4, 1997

F. Boutignon, H. Touchet, P. Wüthrich, S. David et R. Deghenghi

"Production d'implants pour études cliniques"

3e Journées scientifiques d'IDC, septembre 26, 1997, Lourdes, France

G. Fonknechten, P. Genty et P. Wüthrich

"Pharmaceutical compositions based on semi-solid matrices for the controlled release of drug substances"

Pharmaceutical Technology Conference and exhibition, Dublin, March 24-26, 1998

G. Pichon, X. Quenault, H. Rolland, C. Salvadori et P. Wüthrich

"A new biodegradable transmucosal patch: in vivo studies in dogs"

2nd World Meeting on Pharmaceutics, Biopharmaceutics and Pharmaceutical Technology, Paris, May 25-28, 1998

P. Chenevier, B. Huet de Barochez and P. Wüthrich

"Mechanical properties of aqueous-based Eudragit films: Effect of plasticizers and bulking agents on free film characteristics

Pharmaceutical Technology Conference and exhibition, Dublin, March 24-26, 1998

P. Chenevier, B. Huet de Barochez and P. Wüthrich

"Diffusion test of a drug substance through a free Eudragit RS 30D film "

2nd World Meeting on Pharmaceutics, Biopharmaceutics and Pharmaceutical Technology, Paris, May 25-28, 1998

P. Wüthrich

"Intranasal Delivery to Target The Central Nervous System »"

3rd France/Japan drug delivery system symposium. 8-11 November 1998, Tokyo, Japan

G. Fonknechten, P. Genty et P. Wüthrich Glycerides-based excipients for controlled drug release Pharmaceutical Manufacturing Review, April ,21-23 (1999)

P. Wüthrich

"Recent advances in oral chronotherapeutic delivery systems"
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P. Wüthrich

"The administration route: the need for a specific dosage form"
'Better Healthcare for the Elderly: from Medicinal Products to Care in Ageing Populations', EFGCP; Brussels, 23 & 24 January 2003
P. Wüthrich

Utilisation d'un excipient composé : lactose, amidon (STARLAC®) dans les formes orodispersibles. Journées Roquettes : Les formes pharmaceutiques pour patients nomades : choix des excipients, 11 décembre 2003, Lestrem; France

X. Quenault, J.M. Pean, H. Rolland, P. Couvreur and P. Wüthrich Formulation of pegylated liposomes for a new anticancer drug Proc. 30th annual meeting CRS,# 313 July 19-23, 2003 Glasgow, Scotland

M. L. Leichtnam, H. Rolland, R.H. Guy and P. Wüthrich "New aerosol transdermal drug delivery system. Effects of formulation parameters upon spray characteristics and permeation enhancement" Proc. APGI Symposium Skin and Formulation, #43, October 23-24, 2003, Paris

M. L. Leichtnam, R.H. Guy, P. Wüthrich and H. Rolland "Preformulation and evaluation of a transdermal testosterone spray" Proc. AAPS November 7-11,2004, Baltimore, USA

E. Allard, J.-M. Péan, H. Rolland, P. Wüthrich "Solid Dispersion versus Particle Size Reduction to Improve the Dissolution Rate of a Poorly Water-Soluble Drug Substance from Fast-Disintegrating Tablets" Proc. 32th annual meeting CRS,# 664 June 18-22, 2005 Miami Beach, USA

C. Chemin, J.-M. Pean, C. Bourgaux, H. Rolland, P. Wüthrich, P. Couvreur and M. Ollivon "Coupled DSC-SWAXS study of interactions between an anticancer drug and sphingomyelin-based liposomes" ULLA, juillet 2005

- C. Chemin, J.-M. Pean, C. Bourgaux, H. Rolland, P. Wüthrich, P. Couvreur and M. Ollivon "Study of the interaction between an anticancer drug and sphingomyelin-based liposomes" 20th Annual Meeting of the G.T.R.V., 1-2 december 2005, Montpellier, France
- C. Chemin, J.-M. Pean, C. Bourgaux, H. Rolland, P. Wüthrich, P. Couvreur and M. Ollivon "Coupled DSC-SWAXS study of egg sphingomyelin bilayer organization: effect of cholesterol, buffer and temperature"

 Biophysical Society, January 18-22, 2006, Salt Lake City, USA
- C. Chemin, J.-M. Pean, C. Bourgaux, P. Wüthrich, P. Couvreur and M. Ollivon "Supramolecular Organization of S12363-liposomes Prepared with two different remote loading processes"

Proc. 33th annual meeting CRS, # xxx July 22-26, 2006 Vienna, Austria

P. Wüthrich

"Long-circulating liposomes for delivery of anticancer agents: a link in the liposome evolution chain? A case study with the drug substance S12363"

7th France/Japan drug delivery system symposium. 24-27 September 2006, Otsu, Shiga, Japan

C. Chemin, J.-M. Pean, C. Bourgaux, M. German-Fattal, P. Wüthrich, P. Couvreur and M. Ollivon

"Encapsulation du 12363 dans des liposomes furtifs et choix du modèle tumoral pour une stratégie de vectorisation"

XXIIèmes Journées Scientifiques du G.T.R.V. Paris 13-15.12. 2006

P. Wüthrich

"Long-circulating liposomes for delivery of anticancer agents: a link in the liposome evolution chain? A case study with the drug substance S12363"

Therapeutic Nano Object. Genocentre, Evry June 12 2007.